*Emissions*

*GREENHOUSE GASSES*

***WHAT ARE GREENHOSUE GASSES?***

* ***The greenhouse effect*** naturally occurs because there are greenhouses gases in the atmosphere, causing some of the heat from the sun that hits earth to bounce back instead of leaving earth’s atmosphere
* ***Greenhouse gasses***: gases that trap the heat in the atmosphere
  + *Carbon dioxide, methane, nitrous oxide…*
* Greenhouse gasses are created through combustion of fossil fuels, solid waste, wood products…

***WHAT DO GREENHOUSE GASSES DO?***

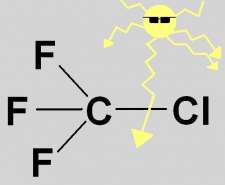
* ***Fossil fuels***: animal or plant matter that has endured extreme heat and pressure within the earths crust, & over about 650 millions years, become fossil fuels
* Fossil fuels emit carbon dioxide when unearthed & when burned
* The carbon dioxide then floats up to the atmosphere & contributes to the greenhouse effect
* Some of the carbon dioxide can mix with water in the atmosphere
  + 🡪Creating ***acid rain***, which ***precipitates*** & changes the ***pH***,
  + 🡪 This effects all plant & animal life
* Some species can’t ***adapt*** to the change of pH & its effect
  + 🡪Those species will become ***extinct***
* Greenhouse gasses also contribute to the depletion of the ozone

*CFC’S*

***WHAT ARE CFC’S?***

* ***CFC*** stands for ***chlorofluorocarbon***
* CFC’s are ***non-toxic*** ***compounds***, & ***non-reactive*** with most other chemicals
  + For this reason, CFC’s served many industrial purposes:
    - Producing coolants for refrigeration & air conditioning
    - Aerosols
    - Propellants
    - Cleaning solvents
    - Insulating materials in Styrofoam packaging
    - Rigid & flexible foam for cushions & home insulators
* CFC’s easily evaporate at normal temperatures (***volatile***) & are not very soluble in water
  + As a result, during production & use they mostly evaporate into the air
  + \*As long as air conditioning /refrigerating equipment is functioning, coolants are sealed within the system, CFC’s only leak into the atmosphere during use when a unit starts breaking down

***WHAT DO CFC’S DO?***

* ***Stratosphere***: Layer of atmosphere about 25 miles up
* CFC’s rise into the stratosphere where they’re exposed to intense sunlight
  + This breaks the CFC compound’s ***bonds***, leaving very ***reactive*** free ***chlorine*** atoms
* Free chlorine atoms literally pull apart ***ozone molecules (O3)***
  + This is the reason there is a hole in the stratosphere’s layer of the ozone
* CFC’s also trap heat like greenhouse gasses, contributing to ***global warming*** & all its impacts

***WHAT IS BEING DONE ABOUT CFC’S?***

* One approach to phasing out CFC’s is replacing them with ***HCFC’s/HFC’s*** (***hydrochlorofluorocarbons***)
  + 🡪 Adding a ***hydrogen*** atom
* HCFC’s are ***less stable***
  + 🡪 More likely to react with other compounds in the ***troposphere***
  + 🡪 Therefor thought less likely to reach the stratosphere/upper atmosphere & do its damage to that part of the ozone
* ***Troposphere:*** Layer of the atmosphere where people live and breathe, below the stratosphere
* There is no discovered safe alternative to CFC’s
* 46 countries have signed the ***Montreal Protocol***, an agreement made to significantly cut down CFC production, where specific goals were set

*For more information*

Energy and Global Warming Impacts of CFC Alternative Technologies. (n.d.). Retrieved November 20, 2014, from <http://www.ciesin.org/docs/011-459/011-459.html>

Center for Sustainability at Aquinas College. (n.d.). Retrieved November 20, 2014, from <http://www.centerforsustainability.org/resources.php?category=50&root>

23, J. (1989, January 23). Friends to Man, Enemies to Earth. Retrieved November 20, 2014, from <http://articles.latimes.com/1989-01-23/local/me-612_1_upper-atmosphere>

(n.d.). Retrieved November 20, 2014, from <http://des.nh.gov/organization/commissioner/pip/factsheets/ard/documents/ard-ehp-34.pdf>

(n.d.). Retrieved November 20, 2014, from <http://www.theozonehole.com/cfc.html>

The Ozone layer - CFC Gases and Background. (n.d.). Retrieved November 20, 2014, from <http://www.technologystudent.com/despro_flsh/ozone1.html>